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Briefing Paper

Interest Rates and the Regional Experience

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Introduction

The possible consequences for Scotland of the present policy of high interest rates are of more than academic interest. The sequence of eleven successive increases in the clearing banks' base rate between 2 June 1988 and 5 October 1989 which raised interest rates from 7.5 per cent to 15 per cent is one of the most remarkable in British financial history. Although there have been other periods of sustained increases in short rates (eg. between September 1971 and November 1973), the only recent comparable episode occurred in the years 1979-1981 when the authorities repeatedly raised the banks' base rate as part of their counter-inflationary strategy. The subsequent financial pressure on the UK economy contributed to the largest contraction in manufacturing output of any industrialised country.

The Bank of England does not normally attempt to spell out the regional implications of its monetary policies. Nevertheless, the analysis of the February 1989 issue of the Bank of England Quarterly Bulletin appeared to contain good news for Scotland because it argued that the highly geared consumer would bear the brunt of high interest rates. As Vines and Bell (1989) have recently emphasised, consumer spending is likely to be less tightly constrained by dear money in Scotland than in the South-East of England because of the relatively low burden of mortgage payments on Scottish householders and, more generally, because of Scotland's less active participation in the UK credit boom of 1988. However, any benefits that Scotland may gain from its relatively low level of owner occupation and its failure to share fully in the rapid growth of real incomes and property values that has characterised the South-East of England should be set against the possible

consequences of high interest rates for Scottish manufacturing industry.

There are two main reasons for tentatively suggesting that Scottish industry may be more severely affected by high interest rates than that of the South-East. First, the relatively strong export orientation of Scottish industry, notably in electronics, whisky, textiles and oil, renders it more sensitive to the contractionary effects of an overvalued exchange rate (Vines and Bell, 1989). The UK exchange rate has been maintained at a level significantly higher than the rate which would have resulted from a free play of market forces only by extraordinary increases in short-term interest rates. Such a policy places export industries at a disadvantage. Second, the Scottish manufacturing base and the manufacturing sectors of several regions located outside the South-East of England appear to have experienced greater hardship than those of the South-East; their industrial structures have contained a disproportionate share of industries that have proved in the past to be unusually sensitive to the effects of sharply increased interest rates. This apparent sensitivity of certain manufacturing sectors to steep rises in interest rates is the principle theme of this article.

Certain economic commentators, notably David Lomax of NatWest² and Jim Walker of The Royal Bank of Scotland³, have recently predicted that Scotland will outperform the rest of the UK, including the South-East, in 1989 and 1990. However, according to our analysis Scotland is likely to achieve more rapid growth in manufacturing output than the South-East only if the industrial structures of the two regions have undergone a radical transformation in their respective sensitivities to high interest rates in the course of the 1980s.

Disentangling Interest Rate Effects

The task of gauging the relevance of past movements in interest rates is made difficult by changes in the rate of inflation associated with such increases and by differences in the relationship between short rates and long rates, as well as by variations in the tightness of fiscal stance, in exchange rates, and in other elements of the macroeconomic environment. At the risk of oversimplifying a complex issue, our concern is not with (a) interest rate increases which result (after a lag) from equilibrating capital market pressures generated by the inflationary process, but with (b) sharp increases in the Base Rate commanded by the Treasury and Bank of England which are designed to curb the excess domestic demand for goods and services and/or to defend the pound. In practice, the distinction between the two categories is not always clear-cut, but we appear to be on safe ground in classifying the increases in Base Rate by a full percentage point, which occurred on 24 August 1988, 25 November 1988, 24 May 1989 and 5 October 1989, as class (b) changes. Real (or inflation-adjusted) short-term interest rates are once again at a level that are exceptional by historical standards.

Vulnerable Industries

If we concentrate for the moment purely on interest rates as a cost which has to be deducted from operating profit, it is possible to identify a number of large industrial sectors that exhibit an unusual degree of "interest sensitivity". By classing such industries as "interest sensitive" we simply mean that any rise in interest rates inflicts a much more severe penalty on their operations than on the average company. We attempt to measure this sensitivity by employing the rough and ready device of a ratio of interest payments/operating profit; industries for whom this ratio rose to a figure in excess of 40 per cent between 1980 and 1982 are classified as "interest sensitive". Although 40 per cent is an arbitrary figure, it represents the approximate peak percentage for the interest/operating profit ratio of all UK manufacturing companies in the record year (for such ratios) of 1974. An advantage of employing a ratio is that it is possible to make comparisons over time without paying any special heed to the associated rates of inflation. This approach also has the Keynesian virtue of using as an economic indicator the

magnitudes that concern businessmen in practice.

As Figure 1 illustrates, the interest/operating profit ratio rose from 31.8 per cent in 1979 to peak at 65.7 per cent in 1982 in the worst affected industrial sectors (motors, shipping and transport, textiles, metals and metal forming, chemicals and mechanical engineering) compared with a far from contemptible increase from 23.5 per cent to 36.0 per cent over the same period for the UK as a whole. Such a spectacular rise of the ratio for the interest sensitive industries requires an explanation. The early 1980s saw a dramatic reduction in profits for these sectors; an operating loss was recorded in 1980 for the motor sector. When this collapse in profits is combined with steeply rising interest costs, the effect on the ratio is dramatic.

The industries that we have characterised as interest sensitive were declining at a rate that was rapid even by the standard of the fast-contracting UK manufacturing sector: employment in interest sensitive industries fell from 44.6 per cent of total employment in manufacturing industry in 1978 to 41.6 per cent in 1980, declining further to 37.9 per cent in 1985; net output in interest sensitive industries made a correspondingly smaller contribution to manufacturing output, declining from 44.8 per cent of manufacturing industry net output in 1978 to 41.2 per cent in 1980 and 39.9 per cent in 1985. It is pertinent to enquire whether the interest sensitive industries are located predominantly in the South-East of England, since it would be a supreme irony if a measure intended to take the steam out of the South-East had its major impact on regions which have so far failed to share in the boom.

According to data from the 1981 Census of Production it seems probable that this is precisely what has happened in the past. Of the six interest sensitive industries, only the motor and chemical industries, with respectively 30.7 per cent and 28.9 per cent employment in the South-East in 1981, employed more than the South-East's average share of UK manufacturing employment (Table 1). Numbers employed in the South-East were, relatively speaking, particularly low in the textile, shipbuilding and repairing, and metals and metal forming industries, which are important employers in Scotland, the Northern region, Yorkshire and Humberside and East Midlands. In other words, the South-East is "in

deficit" overall in interest sensitive industries. Indeed, the exposure of the South of England as a whole to increased interest charges has been limited by a pattern of manufacturing production which favoured industries with no special sensitivity to rises in the rate of interest. By contrast, Scotland and the North of England appear to have developed industrial structures that were unusually susceptible to the effects of higher interest rates. It is possible that the relative immunity of the South-East to high interest rates is even greater than our calculations suggest. This further disparity would occur within the interest sensitive sector if the average firm in the South-East region displayed greater financial strength than its counterparts in the rest of the UK; such is plausibly the case with the richest UK region.

A point that modifies our conclusions in the opposite direction is that interest sensitive industries tend to be high liquidation (and high contraction of output and employment) industries. Each successive period of "dear money" purges these industries of their most vulnerable elements, shrinking the sectors to what may become relative insignificance, or, as occurred in the motor industry in Scotland, helping to eliminate them almost entirely; according to 1985 Census of Production data Scotland had a lower share of the percentage employed in the metal manufacturing, mechanical engineering, motor and textile industries in 1985 than in 1981.

The sharp rise in the profiles of the index of liquidations (see Figure 2) during the last notable period of sudden Base Rate increases appears striking, both for the worst hit sectors and for the aggregate of all sectors. Liquidations continued at record levels during the Thatcherite "economic boom" years between 1982 and 1986 as output, profits and new company registrations displayed strong growth, presumably because many of the newly registered companies failed within a year or two of their birth.

The comparative position of Scotland's insolvencies is also of interest. Table 2 highlights the fact that company insolvencies in Scotland were increasing rapidly at the start of the 1980s. Moreover, while the mortality rate was rising for Scottish companies, the number of new companies registered in the region actually declined in 1980. Scotland's profile of new company registrations is symptomatic of a

disadvantaged region which suffers more than the rest of the economy in recession.

The histograms and tables provide a graphic reminder that within a general economic expansion there may be notable disparities in the fortunes of both individual industries and regions.

Vulnerable Companies

Financial vulnerability has often been defined with reference to a company's small size and relatively illiquid balance sheet position. This emphasis is appropriate to the extent that small size tends to place companies in a relatively high risk category among applicants for loans. Compared with large enterprises their profitability is characteristically lower, the variability of their profits greater, their sales more volatile, their opportunities for diversification more limited, and their failure rate higher. For these reasons small companies should suffer more than larger concerns when credit standards are raised.

Yet financial vulnerability is not a necessary attribute of small companies, nor is it based on an illiquid balance sheet structure in a quantitative sense. The essence of financial vulnerability is the inability of the illiquid company to escape from a position of balance sheet disequilibrium by making an adjustment towards a preferred structure of assets and liabilities appropriate to a "dear money" economic climate.

The Bank of England is, therefore, almost certainly wrong to contemplate with equanimity the rapid increase in bank borrowing and associated gearing ratios by the company sector in the 1980s because it has been matched by a build up of liquid assets. The fact that record company liquidations have occurred alongside this accumulation of liquid assets strongly suggests that the improvement in company profits and liquidity has been heavily skewed.

Let us focus on a characteristically vulnerable manufacturing company. A sequence of increases in bank base rates from 7.5 per cent to 15.0 per cent increases its interest/operating profit ratio and the shock of the unanticipated interest rate rises will tend to heighten uncertainty about future sales and profits.

The rise in borrowing costs sharply reduces net profits. In addition, the vulnerable company's

liquid assets may come under pressure on several fronts. These causes of financial pressure are worth examining in greater detail. First, the company's ability to pay its creditors will depend more directly on the prompt payment by its debtors as cash flow interdependence heightens. If it is in a weak position vis-a-vis its customers, the company is liable to be compelled to extend its credit period, increasing liquid assets recorded in the balance sheet but reducing effective company liquidity as the cash inflow slows down. A small company that has reached its overdraft limit and is experiencing severe financial pressure may be embarrassed by a delay in payment of a bill for as little as £30,000. Should the company have the misfortune to be in an equally weak position relative to its suppliers, it may be forced to pay its bills more quickly than in the past, reducing trade credit taken. In other words, vulnerable companies tend to be the victims of what J.K. Galbraith (1957)⁴ dubbed "coercive credit" whereby trade credit is extracted from suppliers by customers with superior trading power, transferring the main burden of liquidity contraction and balance sheet adjustment from stronger to weaker companies. Moreover, in the new regime of higher interest rates and correspondingly lower bond prices, the hard pressed company can only replenish its depleted cash balances by selling off any marketable securities that it may possess at a capital loss.

Recourse to additional bank borrowing now carries a heightened interest rate penalty and may not, in any case, be freely available since banks will discriminate against their riskier customers in a "dear money" environment. Any rise in interest rates that reduces the liquidity of bank assets is likely to be associated with stiffer credit standards and a measure of credit rationing. The American economists J Stiglitz and A Weiss⁵ noted in 1981 that such a course of action was dictated by prudent banking practice since a rise in interest rates tends to deter risk-averse borrowers, so that the average riskiness of the remaining loan applications increases (the "adverse selection effect"). Additionally, higher interest rates tend to induce certain companies to undertake projects with lower probabilities of success but higher profits when successful, increasing lender's risk. A more straightforward point still is that the repayment burden imposed by a rise in interest rate may increase default risk to such an extent that banking prudence would suggest that a new loan to a financially

vulnerable customer should simply not be made. Sharply increased interest rates are therefore intimately associated with the credit rationing of non-preferred applicants.

Since the liquidity of lenders' portfolios will also have been reduced by the sharp increase in interest rates, the vulnerable company may find that the maturity of overdrafts that were renewed without question in normal circumstances has become effective and its eligibility for a term loan may be temporarily withdrawn; certainly the relationship between borrower and lender will alter to one of greater dependence. In practice, the banks are likely to behave towards distressed companies with greater tolerance and helpfulness than these theories suggest; the matrix of interdependencies among companies that are bank customers raises the spectre of a chain of defaults if credit is withdrawn too abruptly.

Company Financial Profiles in Ease and Squeeze Years

Using a random sample of 306 companies we tested the hypothesis that changes in Base Rate had different effects on interest sensitive and non-interest sensitive companies. All of the companies chosen were included in the Datastream database of accounting information from January 1969 onwards. This sampling procedure avoided any problems that might arise from the inclusion of new companies in the groups. Also, since new companies tend to be especially vulnerable to financial pressure the results presumably understate the consequences of high interest rates. Four of the companies originally selected were subsequently omitted from the sample because of insufficient data in certain years, reducing the sample total to 302. One hundred and seventy-six (58%) of these companies belonged to non-interest sensitive industries and 126 (42%) to industries previously identified as interest sensitive.

Datastream was used to obtain the financial profiles of all companies selected, using data for the period 1978-87. The data were then aggregated and analysed to uncover any changes that occurred when Base Rate was altering in a fashion that might not unfairly be characterised as "ease" or "squeeze". There are well-known problems in identifying periods of monetary ease and stringency. Annual data are frequently inappropriate since interest rates may fall and rise dramatically in the course of a year, as

occurred in the UK in 1988. Again, interest rate levels may rise by significant amounts in both nominal and real terms without apparently exerting any very evident squeeze on the economy, as was seemingly the case in 1984. The procedure adopted by the authors was to define the period 1980-82 as one of squeeze in the UK (regardless of the rate of growth of sterling M3 or other relatively broad monetary variables in these years) and to categorise the remaining years of the period 1978-87 as years of monetary ease; this classification is crude and arbitrary, but does have the virtue of separating the years of greatest financial pressure on British manufacturing from the rest of the period.

Four variables were taken into account in evaluating the association of interest rate changes and changes in company liquidity: the working capital ratio, the quick ratio, the number of days credit given and the number of days credit received. Secondly, four aspects of profitability and asset utilisation were examined: the return on shareholder equity, the return on capital employed, the net profit margin and the ratio of turnover to fixed assets. Thirdly, the capital gearing ratio was used to consider the association between changes in interest rates and the debt-equity mix of each company.

Obviously other sets of variables might have been examined. However, the ratios selected are widely available, are commonly used in practice, and include variables whose behaviour is likely to change in a fairly predictable way in periods of high interest rates and tight money on the one hand and in periods of relative monetary ease on the other.

The average value of each ratio was calculated for both groups for the 1980-82 period which we have termed "squeeze" and for the other years which we have characterised as years of monetary "ease" and the information set out in panel A of Table 3. Data for the bottom decile of both samples (in terms of size) is contained in panel B.

Table 3 provides information that usefully supplements the industrial sector data. Interest sensitive companies were on average less profitable than their non-interest sensitive counterparts in years of expansion and they suffered a much sharper decline in profitability in the years of squeeze. Their capital gearing was higher and increased with financial pressure

in contrast with the non-interest sensitive group of companies which reduced their outstanding indebtedness when interest costs were especially punitive. The working capital and quick ratios of interest sensitive companies were significantly higher than those of non-interest sensitive companies in spite of the much larger average size of the former. However the debtors and creditors ratios did not move in conformity with the authors' predicted response for financially vulnerable companies for either group, although the decline in these ratios was more pronounced in the squeeze for non-interest sensitive companies, suggesting a slightly greater capacity to manipulate certain balance sheet variables.

Panel B contains information which appears to be of special relevance to the analysis of this paper. The smallest ten per cent of interest sensitive companies dramatically increased the amount of net credit given, thereby increasing company liquid assets as conventionally measured but reducing the available cash flow in the years characterised by high interest rates; in other words, they extended their credit to customers substantially but were obliged to pay their bills more quickly, a pattern of behaviour consistent with the theory of coercive trade credit outlined earlier. In contrast, the bottom decile of non-interest sensitive companies extended less credit in the squeeze and accelerated the payment of bills even more than their small interest sensitive counterparts.

In other respects, the small interest sensitive companies conform to the profile that was etched of the financially vulnerable company: profitability fell much more steeply than for non-interest sensitive companies, although starting from roughly similar levels; gearing rose for small interest sensitive companies but declined significantly for small non-interest sensitive companies; liquidity (measured by working capital and quick ratios) fell for interest sensitive but rose for non-interest sensitive small companies. In other words, small companies in interest sensitive industries conformed in every substantive respect to the behaviour pattern postulated for the financially vulnerable concern; small non-interest sensitive companies did not do so. There appears to be good evidence to indicate that small, surviving interest sensitive companies experienced exceptional financial pressure in the squeeze years.

The crudity of the testing procedure adopted has already been conceded. Interest rate change is a complex variable and in theory such factors as (a) the size of the change, (b) the frequency of such change and, (c) the unexpectedness of the change, not to mention (d) the domestic and international financial environment in which changes occur should also be taken into account in considering the likelihood that balance sheet disequilibrium will occur. Nevertheless the severity of the financial pressure exerted on the UK company sector in 1980-82 was so remarkable that, plausibly, all the significant factors that contribute to balance sheet disequilibrium should have been present.

These results are similar to earlier findings by the British economists E W Davis and K A Yeomans (1974)⁶. Their investigations into the balance sheets of 200 companies in the years 1966-70 revealed that small companies which most urgently needed overdraft finance to relieve the pressure on their liquidity position seemed to have suffered worst from heightened standards of creditworthiness. Also, they found evidence that, when credit became dearer and tighter, the smallest and most illiquid companies in the UK provided the biggest increase in net trade credit, whereas large, financially strong companies reduced their net trade credit by the greatest amount (strong companies generally increased trade credit only as part of a sales drive). Chowdhury, Green and Miles (1986) found that in the period 1969-1983 companies tended to increase both liquid assets and trade credit received during years of rising Base Rate; at the same time they reduced bank borrowing and curtailed trade credit given. Since their sample was composed of large quoted companies, their findings were compatible with those of Davis and Yeomans for the earlier period.

As one might anticipate, within both interest sensitive and non-interest sensitive groups, small businesses appear to be hardest hit. Recent research by the Forum of Private Business has confirmed that late payment of debt - on average 75 days between date of invoice and payment - in combination with the high cost of bank borrowing, on which small companies are reliant to compensate for slow payment, is the major source of anxiety. According to the results of the Forum's New Regional Survey of Business Opinions (9 September 1988) small businesses in Scotland and in other regions that have yet to experience the benefits of the Thatcherite boom cited high interest costs

as a source of serious cash-flow problems early in the summer of 1988 in advance of the most significant increases in the cost of borrowing. The Forum reported that nearly two out of five owner-managers in Scotland considered finance and interest rates to be their main problem and concluded that 45 per cent of Scotland's 150,000 small firms were experiencing cash-flow problems arising from the impact of high interest rates on their activities. With each successive rise in the Base Rate of the clearing banks, therefore, the matrix of cash-flow interdependencies tightens the noose around the financially vulnerable concern; the size of an unanticipated demand for cash that may cause financial distress becomes smaller.

Conclusion

The argument that British industry will not be significantly affected by repeated increases in the Base Rate of the clearing banks should be treated with reservation. In a homogeneous economy without regional disparities in income, employment and industrial mix this type of counter-inflationary measure may have substantial merit. However, the evidence of the "dear money" periods in the early years of the 1980s is that high interest rates are non-neutral among regions, among industries and among companies within different industrial sectors. The discriminatory nature of a high interest rate policy is most pernicious when manufacturing industries in the regions whose overheated condition has prompted such measures are the least affected by them. Per contra when the industrial sectors of regions characterised by high unemployment and relatively low growth of real incomes are particularly heavily penalised, the measure is self-evidently inappropriate.

On the evidence of this paper the inability of financially vulnerable companies to restructure their assets and liabilities in a fashion that would diminish the impact of higher interest rates on their cash flow is particularly marked among the smallest companies in the industries that we have described as interest sensitive. A disproportionate number of vulnerable enterprises appear to be located in regions outside the South of England. These regions have therefore been placed at a relative disadvantage by current Government policy and are being made to suffer for conditions of excess demand existing elsewhere. The case for regionally differentiated policy

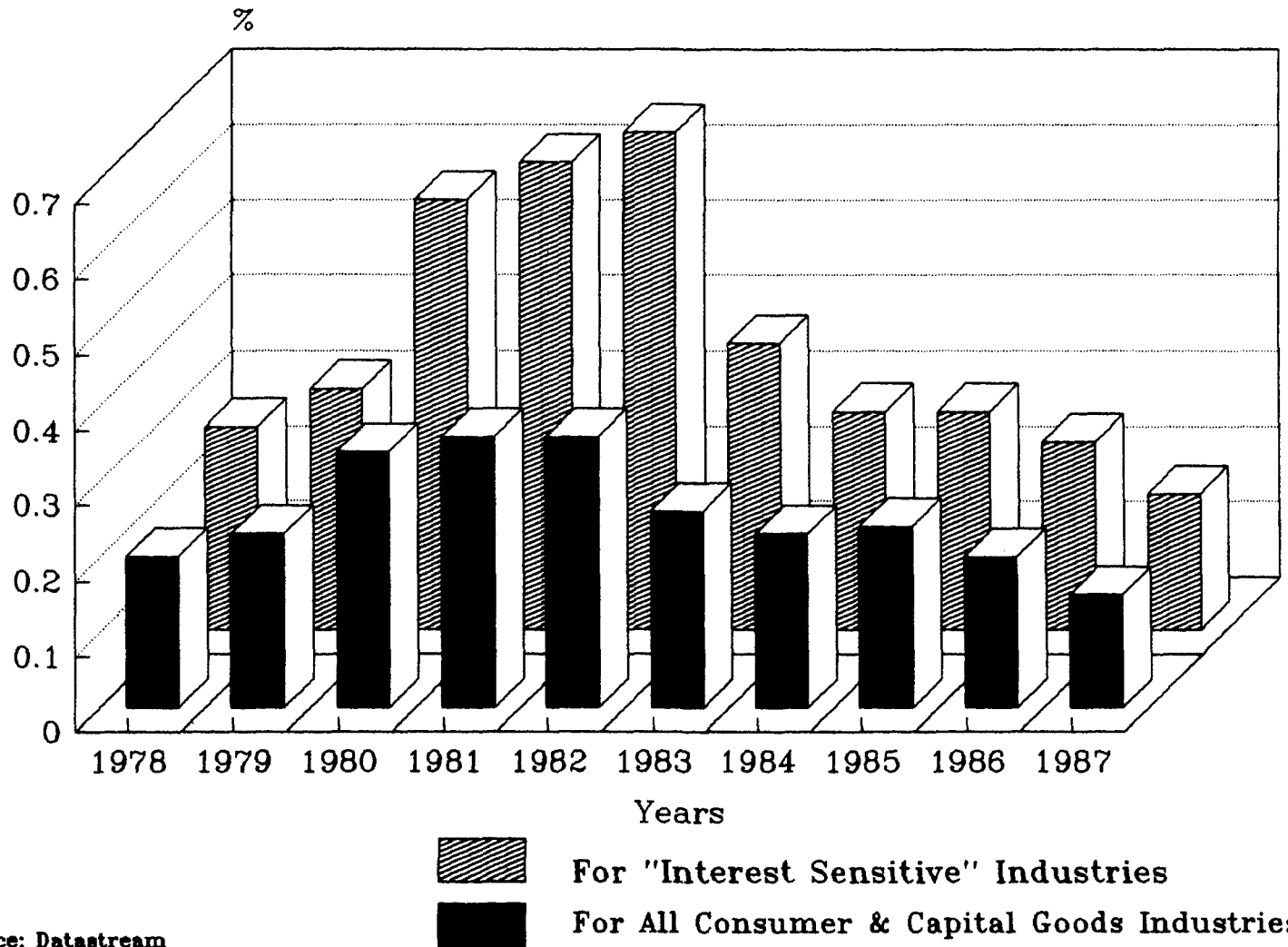
instruments (Begg, 1972)⁸ deserves renewed attention.

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Figure 1

Interest / Operating Profit Ratio



Source: Datastream

TABLE 1

PERCENTAGE EMPLOYMENT SHARE BY REGION IN INTEREST SENSITIVE INDUSTRIES

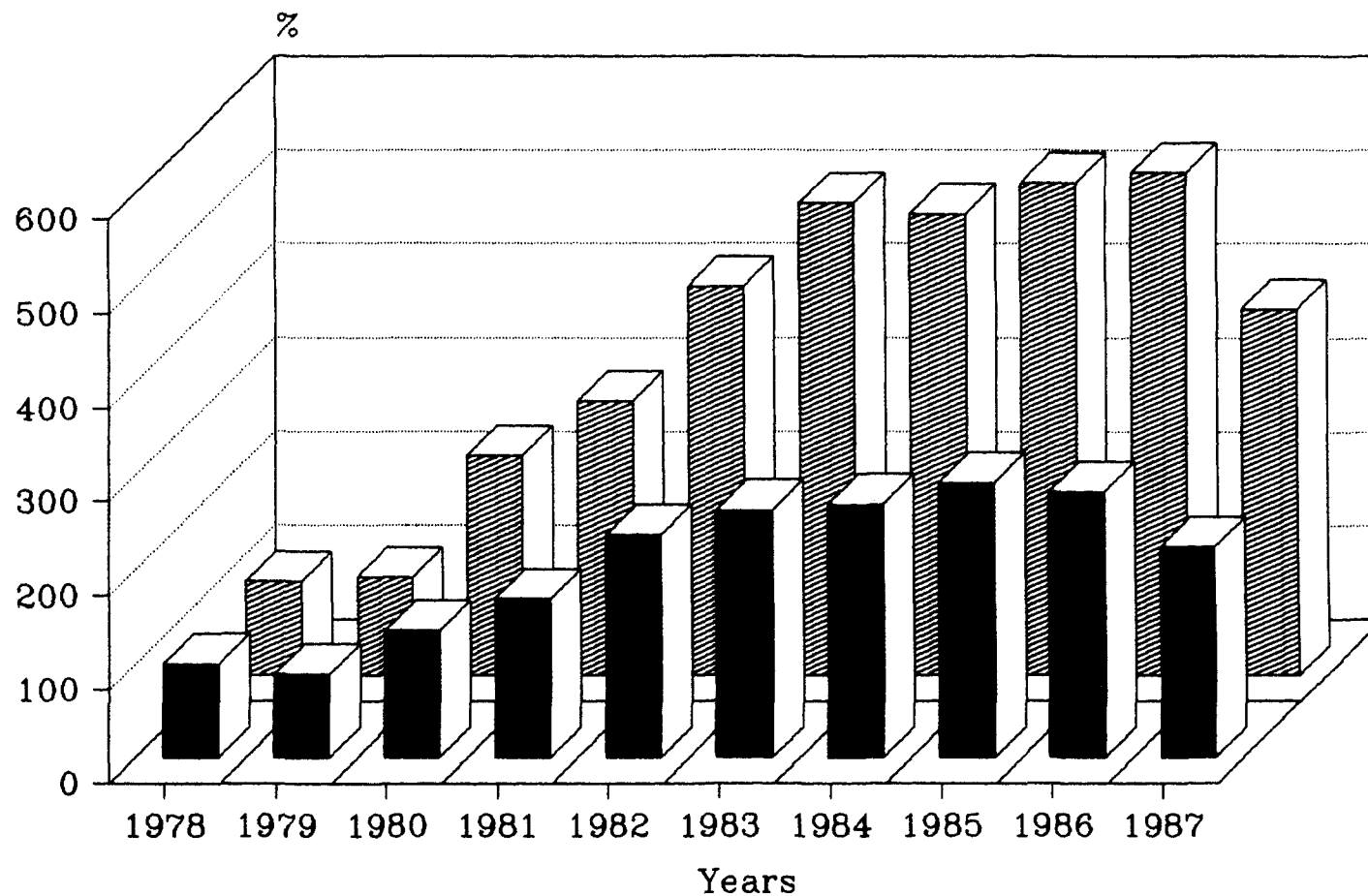
Region	(1) Metal Manufacturing	(2) Chemical	(3) Mechanical Engineering	(4) Motors	(5) Textiles	(6) Shipping & Transport*	(7) Interest Sensitive Industries	(8) All Manufacturing Industry	(9) = 7/8
North	10.3	11.2	6.6	2.2	2.7	9.6	6.9	5.8	119.0
Yorkshire & Humberside	23.3	8.7	11.0	5.6	21.0	5.7	11.4	9.6	115.0
East Midlands	5.0	6.1	9.4	3.2	27.9	9.8	9.7	8.6	112.8
East Anglia	0.5	2.3	4.0	2.3	0.4	1.0	2.3	3.0	76.7
South East	8.1	28.9	24.7	30.7	3.2	21.6	21.6	25.9	83.4
South West	1.6	3.3	6.6	2.9	2.1	17.9	6.3	6.5	96.9
West Midlands	20.6	4.3	13.1	28.1	4.5	5.2	12.8	12.8	100.0
North West	6.0	22.5	11.9	15.3	18.3	14.2	14.4	13.5	106.7
Wales	15.9	4.5	3.0	5.2	1.6	0.9	4.3	4.1	104.9
Scotland	8.6	7.5	8.6	3.5	13.5	10.4	8.5	8.2	103.7
N. Ireland	0.1	0.7	1.1	1.0	4.8	3.7	1.8	2.0	90.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

* Aerospace is included in this industry for the purpose of this table because it was not possible to obtain disaggregated data for 1978 and 1981. This inclusion results in some loss of comparability with Datastream statistics.

Source: Census of Production, 1981

Figure 2

Index of Company Liquidations



Base year 1978= 100

Source: Economic Trends, various editions



For "Interest Sensitive" Industries



For all Industries

Table 2

Registrations and Insolvencies of Companies
in Scotland

<u>Year</u>	<u>New Company</u>		<u>Company</u>	
	<u>Registrations</u>		<u>Insolvencies^a</u>	
	No.	% Change	No.	% Change
1978	2955	-	274	-
1979	3514	18.9	238	-13.1
1980	3270	- 6.9	379	59.2
1981	3475	6.3	438	15.6
1982	4211	21.2	503	14.8
1983	4781	12.0	521	3.6
1984	4976	5.5	523	0.3
1985	5417	8.9	537	2.7
1986	5999	10.7	511	- 4.8
1987	4637	-22.7	461	- 9.8

^a Includes Compulsory and Creditor Voluntary Liquidations.

Source: Scottish Economic Bulletin, various editions; and
Annual Abstract of Statistics, 1989.

Table 3Panel AFinancial Profile of Sample

	Interest Sensitive		Non-Interest Sensitive	
	Ease	Squeeze	Ease	Squeeze
Debtors Ratio	76.96	76.07	68.68	65.99
Creditors Ratio ^a	74.49	72.48	73.44	69.97
Return on Equity	7.13	3.56	10.31	5.99
Return on Capital Employed	14.94	11.64	17.34	14.93
Net Profit Margin	2.83	1.64	4.11	2.75
Turnover/Fixed Assets	6.21	5.85	6.09	6.07
Gearing Ratio	24.17	25.46	23.63	22.49
Working Capital Ratio	1.85	1.89	1.59	1.64
Quick Ratio	1.02	0.99	0.89	0.89
No. of Companies	126		176	
Average Size (Total Assets)	£312.5m		£106.8m	

Panel BFinancial Profile of Bottom Decile

	Interest Sensitive		Non-Interest Sensitive	
	Ease	Squeeze	Ease	Squeeze
Debtors Ratio	76.90	84.19	63.50	60.75
Creditors Ratio ^a	75.31	69.26	69.68	61.69
Return on Equity	10.90	3.73	10.96	7.50
Return on Capital Employed	18.07	13.43	16.84	15.61
Net Profit Margin	2.79	0.37	4.61	3.47
Turnover/Fixed Assets	8.63	7.38	4.22	4.44
Gearing Ratio	25.93	27.61	28.79	26.02
Working Capital Ratio	1.77	1.73	1.52	1.62
Quick Ratio	0.97	0.88	0.83	0.88
No. of Companies	13		18	
Average Size (Total Assets)	£2.8m		£1.8m	

^a One outlier was eliminated from both groups and the average ratio recalculated for the remaining sample.